

N(1900) 3/2⁺ $I(J^P) = \frac{1}{2}(\frac{3}{2}^+)$ Status: ***

The latest GWU analysis (ARNDT 06) finds no evidence for this resonance.

N(1900) BREIT-WIGNER MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
~ 1900 OUR ESTIMATE			
1905 ± 30	ANISOVICH	12A	DPWA Multichannel
1915 ± 60	NIKONOV	08	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1900 ± 8	SHRESTHA	12A	DPWA Multichannel
1951 ± 53	PENNER	02C	DPWA Multichannel
1879 ± 17	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$

NODE=B144

NODE=B144M

NODE=B144M
→ UNCHECKED ←***N(1900) BREIT-WIGNER WIDTH***

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
~ 250 OUR ESTIMATE			
250 ⁺¹²⁰ ₋₅₀	ANISOVICH	12A	DPWA Multichannel
180 ± 40	NIKONOV	08	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
101 ± 15	SHRESTHA	12A	DPWA Multichannel
622 ± 42	PENNER	02C	DPWA Multichannel
498 ± 78	MANLEY	92	IPWA $\pi N \rightarrow \pi N$ & $N\pi\pi$

NODE=B144W

NODE=B144W
→ UNCHECKED ←***N(1900) POLE POSITION***

REAL PART	DOCUMENT ID	TECN	COMMENT
1900 ± 30			
1905 ± 30	ANISOVICH	12A	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1895	SHRESTHA	12A	DPWA Multichannel

-2xIMAGINARY PART	DOCUMENT ID	TECN	COMMENT
200⁺¹⁰⁰₋₆₀			
200 ⁺¹⁰⁰ ₋₆₀	ANISOVICH	12A	DPWA Multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •			
100	SHRESTHA	12A	DPWA Multichannel

NODE=B144230

NODE=B144RE
NODE=B144RENODE=B144IM
NODE=B144IM***N(1900) ELASTIC POLE RESIDUE***

MODULUS <i>r</i>	DOCUMENT ID	TECN	COMMENT
3 ± 2			
3 ± 2	ANISOVICH	12A	DPWA Multichannel
PHASE θ			
10 ± 35			
10 ± 35	ANISOVICH	12A	DPWA Multichannel

NODE=B144240

NODE=B144RER
NODE=B144RERNODE=B144IMR
NODE=B144IMR***N(1900) INELASTIC POLE RESIDUE***

The "normalized residue" is the residue divided by $\Gamma_{pole}/2$.

Normalized residue in $N\pi \rightarrow N(1900) \rightarrow N\eta$	DOCUMENT ID	TECN	COMMENT
5 ± 2	70 ± 60	ANISOVICH	12A DPWA Multichannel
Normalized residue in $N\pi \rightarrow N(1900) \rightarrow \Lambda K$			
7 ± 3	135 ± 25	ANISOVICH	12A DPWA Multichannel

NODE=B144250

NODE=B144250

NODE=B144RS1
NODE=B144RS1NODE=B144RS2
NODE=B144RS2

Normalized residue in $N\pi \rightarrow N(1900) \rightarrow \Sigma K$

<u>MODULUS (%)</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
4±2	110 ± 30	ANISOVICH	12A DPWA	Multichannel

NODE=B144RS3
NODE=B144RS3 **$N(1900)$ DECAY MODES**

Mode	Fraction (Γ_i/Γ)	
$\Gamma_1 N\pi$	~ 10 %	
$\Gamma_2 N\pi\pi$		DESIG=1
$\Gamma_3 N\rho, S=1/2, P\text{-wave}$		DESIG=2
$\Gamma_4 N\eta$	~ 12 %	DESIG=3
$\Gamma_5 N\omega$	(39 ± 9) %	DESIG=4
$\Gamma_6 \Lambda K$	0–10 %	DESIG=5
$\Gamma_7 \Sigma K$	(5.0 ± 2.0) %	DESIG=6; OUR EST
$\Gamma_8 p\gamma$		DESIG=7
$\Gamma_9 p\gamma, \text{ helicity}=1/2$		DESIG=8
$\Gamma_{10} p\gamma, \text{ helicity}=3/2$		DESIG=9
$\Gamma_{11} n\gamma$		DESIG=10
$\Gamma_{12} n\gamma, \text{ helicity}=1/2$		DESIG=11
$\Gamma_{13} n\gamma, \text{ helicity}=3/2$		DESIG=12
		DESIG=13

NODE=B144215; NODE=B144

 $N(1900)$ BRANCHING RATIOS **$\Gamma(N\pi)/\Gamma_{\text{total}}$**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_1/Γ
~ 10 OUR ESTIMATE				
3±2	ANISOVICH	12A DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
7±4	SHRESTHA	12A DPWA	Multichannel	
2 to 9	NIKONOV	08 DPWA	Multichannel	
16±2	PENNER	02C DPWA	Multichannel	
26±6	MANLEY	92 IPWA	$\pi N \rightarrow \pi N \& N\pi\pi$	

NODE=B144220

 $\Gamma(N\eta)/\Gamma_{\text{total}}$

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_4/Γ
~ 12 OUR ESTIMATE				
10±4	ANISOVICH	12A DPWA	Multichannel	
14±5	PENNER	02C DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 1	SHRESTHA	12A DPWA	Multichannel	

NODE=B144R4
NODE=B144R4
→ UNCHECKED ← **$\Gamma(N\omega)/\Gamma_{\text{total}}$**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_5/Γ
39±9	PENNER	02C DPWA	Multichannel	

NODE=B144R5
NODE=B144R5 **$(\Gamma_1\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow N(1900) \rightarrow N\rho, S=1/2, P\text{-wave}$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.21±0.08	SHRESTHA	12A DPWA	Multichannel	
-0.34±0.03	MANLEY	92 IPWA	$\pi N \rightarrow \pi N \& N\pi\pi$	

NODE=B144R2
NODE=B144R2 **$\Gamma(\Lambda K)/\Gamma_{\text{total}}$**

<u>VALUE (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	Γ_6/Γ
0 to 10 OUR ESTIMATE				

NODE=B144R6
NODE=B144R6
→ UNCHECKED ←**16 ± 5 to 10 OUR ESTIMATE**

16 ± 5	ANISOVICH	12A DPWA	Multichannel	
2.4±0.3	SHKLYAR	05 DPWA	Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •				

NODE=B144R6
NODE=B144R6
→ UNCHECKED ←**5 to 15 OUR ESTIMATE**

14 ± 5	SHRESTHA	12A DPWA	Multichannel	
5 to 15	NIKONOV	08 DPWA	Multichannel	
0.1±0.1	PENNER	02C DPWA	Multichannel	

$\Gamma(\Sigma K)/\Gamma_{\text{total}}$

VALUE (%)

DOCUMENT ID TECN COMMENT

5±2

ANISOVICH 12A DPWA Multichannel

• • • We do not use the following data for averages, fits, limits, etc. • • •

1±1

PENNER 02C DPWA Multichannel

 Γ_7/Γ

NODE=B144R7

NODE=B144R7

 $N(1900)$ PHOTON DECAY AMPLITUDES

Papers on γN amplitudes predating 1981 may be found in our 2006 edition,
Journal of Physics, G **33** 1 (2006).

 $N(1900) \rightarrow p\gamma$, helicity-1/2 amplitude $A_{1/2}$ VALUE (GeV $^{-1/2}$)

DOCUMENT ID TECN COMMENT

0.026±0.015

ANISOVICH 12A DPWA Multichannel

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.041±0.008

SHRESTHA 12A DPWA Multichannel

−0.017

PENNER 02D DPWA Multichannel

NODE=B144225

NODE=B144225

NODE=B144A1

NODE=B144A1

 $N(1900) \rightarrow p\gamma$, helicity-3/2 amplitude $A_{3/2}$ VALUE (GeV $^{-1/2}$)

DOCUMENT ID TECN COMMENT

−0.065±0.030

ANISOVICH 12A DPWA Multichannel

• • • We do not use the following data for averages, fits, limits, etc. • • •

−0.004±0.006

SHRESTHA 12A DPWA Multichannel

0.031

PENNER 02D DPWA Multichannel

NODE=B144A2

NODE=B144A2

 $N(1900) \rightarrow n\gamma$, helicity-1/2 amplitude $A_{1/2}$ VALUE (GeV $^{-1/2}$)

DOCUMENT ID TECN COMMENT

• • • We do not use the following data for averages, fits, limits, etc. • • •

−0.010±0.004

SHRESTHA 12A DPWA Multichannel

−0.016

PENNER 02D DPWA Multichannel

NODE=B144A3

NODE=B144A3

 $N(1900) \rightarrow n\gamma$, helicity-3/2 amplitude $A_{3/2}$ VALUE (GeV $^{-1/2}$)

DOCUMENT ID TECN COMMENT

• • • We do not use the following data for averages, fits, limits, etc. • • •

−0.011±0.007

SHRESTHA 12A DPWA Multichannel

−0.002

PENNER 02D DPWA Multichannel

NODE=B144A4

NODE=B144A4

 $N(1900)$ REFERENCES

ANISOVICH	12A	EPJ A48 15	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
NIKONOV	08	PL B662 245	V.A. Nikonov <i>et al.</i>	(Bonn, Gatchina)
ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)
PDG	06	JPG 33 1	W.-M. Yao <i>et al.</i>	(PDG Collab.)
SHKLYAR	05	PR C72 015210	V. Shklyar, H. Lenske, U. Mosel	(GIES)
PENNER	02C	PR C66 055211	G. Penner, U. Mosel	(GIES)
PENNER	02D	PR C66 055212	G. Penner, U. Mosel	(GIES)
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KSA)
Also		PR D30 904	D.M. Manley <i>et al.</i>	(VPI)

NODE=B144

REFID=54041

REFID=54862

REFID=52243

REFID=51535

REFID=51004

REFID=50977

REFID=49129

REFID=49130

REFID=41535

REFID=30071